

ICC-ES Evaluation Report

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This report also contains:

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DIVISION: 06 00 00 — WOOD, PLASTICS AND COMPOSITES

Section: 06 16 00 —

Sheathing

DIVISION: 07 00 00 — THERMAL AND MOISTURE PROTECTION

Section: 07 46 46 — Fiber-Cement Siding REPORT HOLDER: JAMES HARDIE BUILDING PRODUCTS, INC.

EVALUATION SUBJECT:
HARDIE® PANEL
(PREVAIL®,
CEMPANEL®) SIDING,
HARDIE®
ARCHITECTURAL
PANELS, HARDIFLEX®
SIDING AND HARDITEX
BASEBOARD



1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018, 2015, 2012, 2009 and 2006 International Building Code® (IBC)
- 2021, 2018, 2015, 2012, 2009 and 2006 International Residential Code® (IRC)
- 2006 International Energy Conservation Code® (IECC)
- 2013 Abu Dhabi International Building Code (ADIBC)†

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Property evaluated:

- Weather protection
- Structural
- Noncombustible (Types I, II, III and IV) construction
- Fire-resistance-rated construction
- Thermal resistance

1.2 Evaluation to the following green code(s) and/or standards:

- 2022 California Green Building Standard Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)
- 2021, 2018 and 2024 International Green Construction Code® (IgCC)
- 2020 and 2017 ANSI/ASHRAE/USGBC Standard 189.1 Standard for the Design of High-Performance Green Buildings, Except Low-Rise Residential Buildings

Attributes verified:

See Section 3.0

2.0 USES

The James Hardie fiber-cement panels described in this report are used as exterior wall coverings. The panels may be used in fire-resistance-rated construction as set forth in Section 4.3 and may be used on exterior walls of Types I, II, III, IV and V construction.

3.0 DESCRIPTION

3.1 General:

The panels are single-faced, cellulose fiber–reinforced cement (fiber-cement) products identified as Hardie[®] Panel (Prevail[®], Cempanel[®]) panel siding, Hardie[®] Architectural Panels, Hardiflex[®] panel siding and Harditex[®] Baseboard; the panels are supplied either coated or uncoated for subsequent application of a compatible exterior-grade top coat. Nominal product dimensions are noted in Table 1.

The panels comply with ASTM C1186, Grade II, Type A. They have a nominal density of 83 lbs/ft³ (1332 kg/m³); a flame-spread index of 0 and a smoke-developed index of 5 or less when tested in accordance with ASTM E84; and are classified as noncombustible when tested in accordance with ASTM E136. Thermal conductance (K) and thermal resistance (R) values for the panels are as shown in <u>Table 2</u>. When tested in accordance with ASTM E96, products with a thickness of $^{1}/_{4}$ inch (6.4 mm) and $^{5}/_{16}$ inch (7.5 mm) have permeance values given in <u>Table 3</u>.

The attributes of the fiber-cement sidings have been verified as conforming to the provisions of ICC 700-2020, ICC 700-2015 and ICC-700-2012 Sections 602.1.6 and 11.602.1.6 (termite-resistant materials); (ii) ICC 700-2008 Section 602.8 (termite-resistant materials); (iii) CALGreen Section A4.405. 1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (iv) ICC 700-2020 Sections 601.7 and 11.601.7 (prefinished materials); (v) ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7 and 12.1(A).601.7 (prefinished materials); (vii) ICC 700-2020 Sections 611.1.2 and 11.611.1.2 (Product Specific Declarations); (viii) ICC 700-2015 Sections 611.4.2 and 11.611.4.2 (Product Specific Declarations); (vi) 2021 and 2018 IgCC Section 901.4.1.4.2 (Product Specific Declarations); (x) 2015 IgCC Section 505.4.1 (Product Specific Declarations); (xi) and 2020 and 2017 ASHRAE 189.1 Section 9.4.1.4.2 (Product Specific Declarations). The users are advised of the project-specific provisions that may be contingent upon meeting specific condition, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

Note: The Environmental Product Declaration (EPD) provide to ICC-ES was verified by a Program Operator other than ICC-ES. ICC-ES makes no claims or warranties regarding the contents of the EPD provided. Please contact the report holder to obtain a copy of the PED and confirm its validity; see Section 7.0 for the report holder's contact information.

3.2 Materials:

- **3.2.1** Hardie® Panel (Prevail®, Cempanel®) Siding: Hardie® Panel Prevail®, Cempanel® siding is available with various surface textures including smooth. Nominal product dimensions are noted in <u>Table 1</u> of this report.
- **3.2.2 Hardie® Architectural Panels:** Hardie® Architectural Panels are available as non-grooved or as grooved panels with various surface textures. Nominal product dimensions are noted in <u>Table 1</u> of this report (see note 1 in <u>Table 1</u> regarding nominal dimensions of grooved panels).
- **3.2.3 Hardiflex**[®] **Siding:** Hardiflex[®] siding is available in various textures including smooth. Nominal product dimensions are noted in Table 1 of this report.
- **3.2.4 Harditex**[®] **Baseboard:** Harditex[®] Baseboard is used as a starter strip for exterior applications of walls and soffits. Harditex[®] Baseboard has an untextured finish and is available with either tapered or trough edges on the two long sides for joint treatment or all square edges. Harditex[®] Baseboard is supplied either sealed or unsealed for the subsequent application of a primer or sealer by the end user as a component in a direct-applied exterior coating or finish system. Nominal dimensions are noted in Table 1 of this report.

3.3 Fasteners:

Fastener type, size and spacing must be as shown in Table 4.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The maximum basic wind speeds for positive and negative transverse load resistance are presented in Table 4.

4.2 Installation:

- **4.2.1 General: The** manufacturer's published installation instructions and this report must be strictly adhered to and a copy of this report and the instructions must be available on the jobsite during construction. The panels must be installed in accordance with 2021 and 2018 IBC Section 1404.16; 2015, 2012, and 2009 IBC Section 1405.16; and 2006 IBC Section 1405.15; and 2018 and 2018 IRC Table R703.3 and Section R703.10; 2012, 2009, and 2006 IRC Table R703.4 and Section R703.10, and the manufacturer's installation instructions.
- **4.2.2** Hardie® Panel (Prevail®, Cempanel®) Siding: The panels are applied with the long dimension either parallel or perpendicular to framing. Vertical joints are fastened at abutting sheet edges. Vertical joints must occur over framing or wood furring members except where the panels are installed and fastened to wood structural panel sheathing in accordance with Table 4. The vertical joints must be sealed with caulking covered with battens, or must be designed to comply with 2021 and 2018 IBC Section 1402.2; and 2015, 2012, 2009, and 2006 IBC Section 1403.2; and IRC Section R703.1. Horizontal joints must be flashed with Z-flashing. Fasteners must be installed with a minimum $^{3}/_{8}$ -inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Where a specified level of wind resistance is required, the panel siding is attached to framing members, furring members, or wood structural panel sheathing, appropriately spaced, with fastener types, lengths, and spacing described in Table 4.
- **4.2.3 Hardie® Architectural Panels:** The panels are applied with the long dimension parallel or perpendicular to framing. Vertical joints are fastened at abutting sheet edges. Vertical joints must occur over framing except where the panels are installed and fastened directly to wood structural panel sheathing in accordance with <u>Table 4</u>. The vertical joints must be sealed with caulking, covered with battens, or must be designed to comply with 2021 and 2018 IBC Section 1402.2; and 2015, 2012, 2009, and 2006 IBC Section 1403.2; and IRC Section R703.1. Horizontal joints must be flashed with Z-flashing. Fasteners must be installed with a minimum ³/₈-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Where a specified level of wind resistance is required, the panel siding is attached to framing members, furring members, or wood structural panel sheathing, appropriately spaced, with fastener types, lengths, and spacing described in <u>Table 4</u>.
- **4.2.4 Hardiflex® Siding:** The panels are applied with the long dimension either parallel or perpendicular to framing and with all panel edges supported by framing. Fasteners must be installed with a minimum ³/₈-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Joints must be fastened at abutting sheet edges. Vertical joints must occur over framing members and must be protected by PVC joint treatment, lumber battens, or sealant. Horizontal joints must be flashed with metal Z-flashing and blocked with solid framing. Where a specified level of wind resistance is required, the panel siding is attached to framing members, appropriately spaced, with fastener types, lengths, and spacing as noted in <u>Table 4</u>.
- **4.2.5 Harditex Baseboard:** The panels are applied with the long dimension either parallel or perpendicular to framing and with all panel edges supported by framing. Vertical and horizontal joints must be sealed with a sealant or bedding compound, including any required joint reinforcing mesh or tape, specified by the coating or finish system manufacturer. Fasteners must be installed with a minimum ³/₈-inch (9.5 mm) edge distance and a minimum 2-inch (51 mm) clearance from corners. Where a specified level of wind resistance is required, the baseboard is attached to framing members, appropriately spaced, with fasteners types, lengths, and spacing as noted in Table 4.

4.3 Fire-resistance-rated Assemblies:

4.3.1 Assembly 1—One-hour Asymmetrical Nonload-bearing:

4.3.1.1 Interior Face: The asymmetrical, nonload-bearing, one-hour fire-resistance-rated wall assembly consists of minimum 3⁵/₈-inch-deep (92 mm), No. 20 gage [0.0359-inch (0.91 mm)] steel "C" studs spaced at a maximum of 24 inches (610 mm) on center, with corresponding top and bottom tracks. One layer of ⁵/₈-inch-thick (15.9 mm), Type X gypsum board complying with ASTM C1396, 48 inches (1219 mm) wide, is applied vertically to the interior side of the studs and secured with 1¹/₄-inch-long (32 mm), Type S, gypsum board

screws, spaced 8 inches (203 mm) on center at board edges and 12 inches (305 mm) on center at intermediate framing members. All board joints must be backed by framing members. The ⁵/₈-inch-thick (15.9 mm) gypsum board joints and screw heads must be finished in accordance with ASTM C840.

- **4.3.2 Exterior Face:** The exterior side of the studs must be covered with one layer of \$\frac{1}{2}\$-inch-thick (12.7 mm), Type X, water-resistant gypsum board complying with ASTM C1396, followed by one layer of minimum \$\frac{1}{4}\$-inch-thick (6.4 mm) Hardie® Panel (Prevail®, Cempanel®), or Hardiflex® siding or Harditex® Baseboard or Hardie® Architectural Panels (non-grooved). The Type X gypsum boards must be applied vertically to framing members with vertical edges staggered 24 inches (610 mm). The \$\frac{1}{2}\$-inch-thick (12.7 mm), Type X gypsum board must be fastened to the framing members with \$1^{1}/4\$-inch-long (32 mm), Type S, gypsum board screws spaced 24 inches (610 mm) on center. All gypsum board joints must be backed by framing members. Hardie® Panel (Prevail®, Cempanel®), or Hardiflex® siding or Harditex® Baseboards, or Hardie® Architectural Panels (non-grooved) must be fastened through the gypsum board to the framing members with minimum \$1^{5}/8\$-inch-long 41 mm) by minimum 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed buglehead or ribbed wafer head screws located a maximum of 8 inches (203 mm) on center. Hardie® Panel (Prevail®, Cempanel®), Hardiflex® siding, Harditex® Baseboard or Hardie® Architectural Panels (non-grooved) joints require treatment similar to that described in Sections 4.2.2, 4.2.3 and 3.2.3, respectively.
- 4.3.3 Assembly 2—One-hour Nonload-bearing: The nonload-bearing, one-hour, fire-resistance-rated wall assembly consists of minimum 3⁵/₈-inch-deep (92 mm), No. 20 gage [0.0359 inch (0.91 mm)], steel "C" studs spaced at a maximum of 24 inches (610 mm) on center, with corresponding top and bottom tracks. Both sides of the wall must be covered with one layer of ¹/₂-inch-thick (12.7 mm), Type X gypsum board (interior side)/gypsum sheathing (exterior side) complying with ASTM C1396, followed by one layer of minimum ¹/₄-inch-thick (6.4 mm) Hardie® Panel (Prevail®, Cempanel®), or Hardiflex® siding, Harditex® Baseboard or Hardie® Architectural Panels (non-grooved). The panels must be applied either perpendicular (horizontally) or parallel (vertically) to framing members. All board joints must be backed by framing. Base layer and face layer board joints of both wall sides must be offset by 24 inches (610 mm). The ¹/₂-inch-thick (12.7 mm), Type X gypsum board/sheathing must be fastened to the framing members with minimum 1-inch-long (25.4 mm), Type S, gypsum board screws spaced a maximum of 24 inches (610 mm) on center. The panels must be fastened through the gypsum board to the framing members with minimum 1⁵/₈-inch-long (41 mm) by minimum 0.323-inch (8.2 mm) HD self-drilling, corrosion-resistant, ribbed, buglehead or ribbed wafer head screws located a maximum of 8 inches (203 mm) on center. Panel joints and fasteners require treatment similar to that described in Section 4.2.2, 4.2.3 or 4.2.4, of this report.

5.0 CONDITIONS OF USE:

The Hardie[®] Panel (Prevail[®], Cempanel[®]), or Hardie[®] Architectural Panels and Hardiflex[®] panel sidings, and Harditex[®] baseboard products, described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The panels must be installed in accordance with the applicable code, this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's instructions, this report governs.
- **5.2** Design wind loads applied to the siding panels must be determined in accordance with the applicable code and must be equal to, or less than, the allowable loads shown in Table 4.
- 5.3 Use of the products listed in this report as a lateral-force-resisting element of a shear wall that resists wind or seismic forces is beyond the scope of this report. Walls must be braced by other means as required by the applicable code.
- **5.4** The exterior plank and panel products installed on exterior walls must be installed over a weather- resistive barrier in accordance with applicable codes.
- **5.5** Flashing must be installed at all penetrations and terminations in accordance with the applicable code and the manufacturer's instructions.
- 5.6 In jurisdictions adopting the 2021, 2018, 2015, and 2012 IBC, vertical and lateral flame propagation2021 and 2018 IBC Section 1402.5; and 2015 and 2012 IBC Section 1403.5; exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and that contain a combustible water-resistive barrier must be shown to comply with NFPA 285, except as permitted under Exception 2 of the 2021 and 2018 IBC Section 1402.5 and 2015 IBC Section 1403.5.

- **5.7** The products are manufactured at the following locations under a quality-control program with inspections by ICC-ES:
 - Cleburne, Texas
 - Plant City, Florida
 - Tacoma, Washington
 - · Waxahachie, Texas
 - · Peru, Illinois
 - · Pulaski, Virginia
 - Sparks, Nevada
 - Fontana, California
 - Prattville, Alabama

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Siding Used as Exterior Wall Siding (AC90), dated October 2020 (editorially revised December 2020).

7.0 IDENTIFICATION

- **7.1** For field identification, James Hardie Building Products, Inc., Hardie® Panel (Prevail®, Cempanel®), or Hardie® Architectural Panels and Hardiflex® panel sidings, and Harditex® baseboards, must bear a label with the manufacturer's name and telephone number, the product name, and the evaluation report number (ESR-1844).
- **7.2** The report holder's contact information is the following:

JAMES HARDIE BUILDING PRODUCTS, INC. 10901 ELM AVENUE FONTANA, CALIFORNIA 92337 (909) 942-7343 info@jameshardie.com www.jameshardie.com



TABLE 1—STANDARD NOMINAL PANEL DIMENSIONS

PRODUCT	WIDTH (inches)	LENGTH (feet)	THICKNESSES (inch)
Hardie [®] Panel siding (48")	48	8, 9, 10 & 12	¹ / ₄ & ⁵ / ₁₆
Hardie® Panel siding (16")	16	8, 9, 10 & 12	⁵ / ₁₆
Cempanel® siding	48	8, 9, 10, & 12	⁵ / ₁₆
Prevail [®] siding	48	8, 10, & 12	⁵ / ₁₆
Hardie® Architectural Panels1	48	8, 10, & 12	⁵ / ₁₆
Hardiflex® panel	48	8, 9, & 10	¹ / ₄ & ⁵ / ₁₆
Harditex® baseboard	48	8, 9, & 10	¹ / ₄ & ⁵ / ₁₆

For **SI:** 1 inch = 25.4 mm, 1 ft = 305 mm.

TABLE 2—"K" and "R" VALUES FOR FIBER-CEMENT PRODUCTS

PRODUCT THICKNESS ³	THERMAL CONDUCTANCE ¹	THERMAL RESISTANCE ¹	ACTUAL THERMAL CONDUCTANCE ²	ACTUAL THERMAL RESISTANCE ²
(inch)	K _{eff} = Btu/hr-ft²-ºF	R = 1/K _{eff}	(K _{eff})	(R)
1/4	1.95	0.51	7.80	0.13
⁵ / ₁₆	2.07	0.48	6.62	0.15

For **SI:** 1 inch = 25.4 mm, 1 Btu/h-ft²-°F = 5.678 W/m^2 -K.

TABLE 3—PERMEANCE VALUES FOR FIBER-CEMENT PRODUCTS

PRODUCT THICKNESS ¹ (inch)	PERMEANCE (perms)
1/4	1.75
⁵ / ₁₆	1.54

For **SI**: 1 inch = 25.4 mm, 1 perm = 57 mg/(s·m²·Pa).

 $^{^{\}rm 1}$ The grooved panels are 0.213 inch (5.4 mm) thick at groove locations.

¹Based on 1 inch of panel thickness.

²Actual value for panel thickness shown.

							2012 IRC, 2009 IBC/IRC 2006 IBC/IRC (Basic Wind Speed, V _{asd} ^{1,5,8})			2012 IBC and 2015 IBC/IRC (Ultimate Design Wind Speed, V _{ut} 6.7), 2018 and 2021 IBC/IRC (Basic Design Wind Speed, V ^{9,10}) EXPOSURE CATEGOR)			
							EXPOS	URE CAT	EGORY	EXPOS	URE CAT	EGORY	
Product	Minimum Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D	
Hardiflex® Hardie [®] Panel (48")	1/4	4d common, 1½-in long	8	2 x 4 wood ³	16	20 40 60	105 95 85	- - -	- - -	136 123 110	- - -	- - -	
Hardiflex® Hardie [®] Panel (48")	1/4	4d common, 1½-in long	8	2 x 4 wood ³	24	20	85	-	-	110	-	-	
Hardiflex® Hardie [®] Panel (48")	1/4	6d common, 2 in. long	6	2 x 4 wood ³	16	20 40 60	137 137 137	116 105 105	- - -	177 177 177	150 136 136		
Hardiflex® Hardie [®] Panel (48")	1/4	No. 11 ga. x 1¼-in. long galvanized roofing nail	6	2 x 4 wood ³	16	20 40	126 121	95 95	-	163 156	123 123	-	
Hardiflex® Hardie® Panel (48") Harditex®	1/4	No. 11 ga. x 1¼-in. long galvanized roofing nail	6	2 x 4 wood ³	24	20 40	95 95	-	-	123 123	-	-	
Hardiflex [®] Hardie [®] Panel (48") Harditex [®]	1/4	No. 11 ga. x 1¼-in. long galvanized roofing nail	4 edge, 12 field	2 x 4 wood ³	16	20 40 60	137 137 126	105 105 95	- - -	177 177 163	136 136 123	- -	
Hardiflex® Hardie® Panel (48")	⁵ / ₁₆	0.091-in. shank x .225- in HD x 1½-in. long ring shank nail	4 edge, 8 field	2 x 4 wood ³	16	20 40 60	112 107 101	98 92 88	90 85 -	145 138 130	127 119 114	116 110 -	
Hardiflex® Hardie® Panel (48")	⁵ / ₁₆	4d common, 1½-in long	8	2 x 4 wood ³	16	40	126	95	-	163	123	-	
Hardiflex [®] Hardie [®] Panel (48")	⁵ / ₁₆	4d common, 1½-in long	8	2 x 4 wood ³	24	20 40	105 95	-	-	136 123	-	-	
Hardiflex® Hardie® Panel (48" and 16")	⁵ / ₁₆	6d common, 2 in. long	4	2 x 4 wood ³	16	0-15 20 40 60	181 181 174 164	164 159 148 142	149 146 137 132	234 234 225 212	212 205 191 183	192 188 177 170	
Hardiflex [®] Hardie [®] Panel (48")	⁵ / ₁₆	6d common, 2 in. long	4	2 x 4 wood ³	24	0-15 20 40 60	141 141 135 128	128 124 116 111	116 113 107 103	182 182 174 165	165 160 150 143	150 146 138 133	
Hardiflex® Hardie® Panel (48" and 16")	⁵ / ₁₆	6d common, 2 in. long	6	2 x 4 wood ³	16	0-15 20 40 60	144 144 138 130	130 127 118 113	118 116 109 105	186 186 178 168	168 164 152 146	152 150 141 136	
Hardiflex [®] Hardie [®] Panel (48")	⁵ / ₁₆	6d common, 2 in. long	6	2 x 4 wood ³	24	0-15 20 40 60	114 114 109 103	103 101 94 90	94 92 86 -	147 147 141 133	133 130 121 116	121 119 111 -	

							20 (Basi	C, 2009 II 06 IBC/IF c Wind S V _{asd} ^{1,5,8})	RC peed,	(Ultim Speed, 2021 Desig	IBC and IBC/IRC ate Desig V _{ult} ^{6,7}), 20 IBC/IRC (IN Wind S V ^{9,10})	n Wind 018 and Basic speed,		
								ATEGOR			ATEGOR			
Product	Minimum Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D		
						0-15	148	134	122	191	173	158		
Hardie [®] Panel (48")	⁵ / ₁₆	6D siding nails (0.092" shank X	6	2 x 4 wood ³	16	20	148	131	119	191	169	154		
Harule Faller (40)	716	0.222" HD x 2" long)	0	2 X 4 WOOU'	10	40	142	121	112	183	157	145		
		2 long)				60	134	117	108	173	150	140		
Hardiflex®	⁵ / ₁₆	6d common,	6 edge,	2 x 4 wood ³	16	40	137	105	-	177	136	-		
Hardie [®] Panel (48")	, 10	2 in. long	12 field	2 % 1 11000	.0	60	126	100	-	163	129	-		
		0.091-in. shank x				20	126	95	-	163	123	-		
Hardiflex [®] Hardie [®] Panel (48")	⁵ / ₁₆	.225-in HD x 1½-in. long	3 edge, 8 field	2 x 4 wood ⁴	16	40	110	90	-	142	116	-		
riardic Taner (40)		ring shank nail	Officia			60	100	85	-	129	110	-		
		No. 8 X 1-5/8		Attached to		0-15	150	136	123	194	176	159		
Hardie [®] Panel (48")	⁵ / ₁₆	in. long X 0.375 in. HD	6" OC vertically /	⁷ / ₁₆ " wood structural	7/16" WSP	20	150	132	120	194	170	155		
,		ribbed waferhead	12" OC horizontally	panel sheathing	attached per code	40	143	123	113	185	159	146		
		screw		only		60	136	118	109	176	152	141		
		Min. No. 8 x 1-in. long x		Min. No. 20		20	137	105	-	177	136	-		
Hardiflex [®] Hardie [®] Panel (48")	1/4	0.323-in. HD ribbed	6	ga. (33 mil) X 3 ⁵ / ₈ in. x	16	40	126	105	-	163	136	-		
Transic Tarier (40)		buglehead screw		1 ³ / ₈ in. metal C-stud		60	116	95	-	150	123	-		
		Min. No. 8 x 1-in. long x		Min. No. 20 ga. (33 mil)		20	105	85	-	136	110	-		
Hardiflex [®] Hardie [®] Panel (48")	1/4	0.323-in. HD ribbed buglehead screw	6	X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C-stud	24	40	95	-	-	123	-	-		
		ET & F 0.10- in. knurled	4 edge, 8 field			15	153	139	127	198	179	164		
Hardiflex [®] Hardie [®] Panel (48"	⁵ / ₁₆	shank x 1½- in. long x	For 48" Panel;	Min. No. 20 ga. (33 mil)	16	20	153	135	124	198	174	160		
and 16")	7/16	0.25-in. HD pin fastener	4 edge	X 3 ⁵ / ₈ in. x 16 1 ³ / ₈ in. metal C-stud	10	40	147	126	116	190	163	150		
		(AKN100- 0150NA)	For 16" Panel			60	139	121	112	179	156	145		
		ET & F 0.10- in. knurled				15	118	107	98	152	138	127		
Hardiflex [®]	E.	shank x 1½- in. long x	4 edge,	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C-stud	ga. (33 mil)	ga. (33 mil)		20	118	104	95	152	134	123
Hardie® Panel (48")	⁵ / ₁₆	0.25-in. HD pin fastener	8 field		24	40	114	97	90	147	125	116		
		(AKN100- 0150NA)				60	107	93	87	138	120	112		

2012 IBC and 2015

IBC/IRC(Ultimate

2012 IRC, 2009 IBC/IRC,

							20 (Bas	C, 2009 II 006 IBC/IF ic Wind S V _{asd} ^{1,5,8,11}	RC peed,	Desig V _{ult} ^{6,7}) IBC (Ba	/IRC(Ultin yn Wind S , 2018 and isic Desig peed, V ^{9,1}	peed, d 2021 jn Wind
							EXPOS	URE CAT	EGORY	EXPOS	URE CAT	EGORY
Product	Minimum Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Framing Spacing (in.)	Building Height (ft.)	В	C	D	В	С	D
Hardie [®] Panel (48" and 16")	⁵ / ₁₆	No. 8 X 1.25" long X 0.323" HD ribbed bugle head screws	6" O.C.	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C- stud or 2 X	16	15 20 40 60	149 149 143 135	135 132 122 117	123 120 113 109	193 193 185 175	175 170 158 152	159 155 146 141
Hardie [®] Panel (48" and 16")	⁵ / ₁₆	No. 8 X 1.25"long X 0.323" HD ribbed bugle head screws	8" O.C.	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C- stud or 2 X 4 wood studs ³	16	0-15 20 40 60	135 135 129 122	122 119 111 106	111 109 102 99	174 174 167 158	158 154 143 137	144 140 132 127
Hardie [®] Panel (48" and 16")	⁵ / ₁₆	No. 8 X 1.25" long X 0.323" HD ribbed bugle head screws	10" O.C.	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C- stud or 2 X 4 wood studs ³	16	0-15 20 40 60	127 127 122 115	115 112 104 100	105 102 96 93	164 164 157 149	149 145 134 129	135 132 124 120
Hardie [®] Panel (48" and 16")	⁵ / ₁₆	No. 8 X 1.25" long X 0.323" HD ribbed bugle head screws	12" O.C.	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C- stud or 2 X 4 wood studs ³	16	0-15 20 40 60	121 121 116 110	110 107 100 95	100 98 92 89	157 157 150 142	142 138 128 123	129 126 119 114
Hardie [®] Panel (48")	⁵ / ₁₆	No. 8 X 1.25" long X 0.323" HD ribbed bugle head screws	8" O.C.	Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C- stud or 2 X 4 wood studs ³	24	0-15 20 40 60	107 107 103 97	97 94 88 84	88 86 81 78	138 138 133 125	125 122 113 109	114 111 105 101
Hardie [®] Panel (48")	5/16	HardieNail Studless Siding Fastener (TetraGrip), .117" x 1.125" x .3" (PART #650867 or #650964)	12"x12" O.C.	Attached to 7/16" Wood Structural Panel sheathing only	⁷ / ₁₆ " WSP Sheathing attached per code	0-15 20 40 60	108 108 104 98	98 95 88	89 87 -	139 139 134 126	126 123 114	115 112 -
Hardie [®] Panel (48")	5/16	HardieNail Studless Siding Fastener (TetraGrip), .117" x 1.125" x .3" (PART #650867 or #650964)	12"x8" O.C.	Attached to 7/16" Wood Structural Panel sheathing only	⁷ / ₁₆ " WSP Sheathing attached per code	0-15 20 40 60	127 127 122 115	115 112 104 100	105 102 96 93	164 164 157 149	149 144 134 129	135 132 124 120

For SI: 1 ft = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s.

¹ Wind speed design assumptions per Section 6.5, Method 2, of ASCE 7-05: I = 1.0, Kzt = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

² Installation must be in accordance with Section 4.2 of this report.

Values are for species of wood having a specific gravity of 0.42 or greater.
 Values are for species of wood having a specific gravity of 0.36 or greater.

Vasd = nominal design wind speed.
 Vult = ultimate design wind speed.

⁷ Wind speed design assumptions per Section 30.4, of ASCE 7-10: Kzt = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

 $^{^{8}}$ 2015 and 2012 IBC Section 1609.3.1, Eqn. 16-33, $V_{asd} = V_{ult} \sqrt{0.6}$

⁹ V = basic design wind speed

 $^{^{10}}$ Wind speed design assumptions per Section 30.3, of ASCE 7-16: $K_{zt} = 1$, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

¹¹ 2021 IBC Section 1609.3.1, Eqn. 16-17 and 2018 IBC Section 1609.3.1, Eqn. 16-33, $V_{asd} = V \sqrt{0.6}$

¹² Smooth-shank stainless steel nails are outside of the scope of this report unless specifically noted.

2012 IBC and 2015

							IBC/IR (Basi	12 IRC, 20 C, 2006 II c Wind S V _{asd} ^{1,5,8,15}	BC/IRC peed,)	IBC/ Desig V _{ult} ^{6,7}), IBC/IR0 Wind	IRC(Ulting Mind Solution Wind Solution	speed, d 2021 Design V ^{13,14})
								ATEGOR			Y	
Product	Minimum Product Thickness (in.)	Fastener Type ¹⁶	Fastener Spacing (in.)	Frame Type	Furring Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D
		No. 8 X		2X4 wood or 20 ga. (33 mil) steel		15	149	135	123	193	175	159
Hardie® Panel (48"	⁵ / ₁₆	1.25" long X 0.323"	6" O.C. into	framing with ³ / ₄ " thick by 3.5"	16	20	149	132	120	193	170	155
and 16")		HD ribbed bugle head	furring only	wide wood furring or 20 ga.		40	143	122	113	185	158	146
		screws		(33 mil.) steel furring ^{9,10,11,12}		60	135	117	109	175	152	141
		No. 8 X		2X4 wood or 20 ga. (33 mil) steel		0-15	135	122	111	174	158	144
Hardie [®] Panel (48"	5/	1.25"long X 0.323" HD	8" O.C. into	framing with 3/4" thick by 3.5"	40	20	135	119	109	174	154	140
and 16") `	⁵ / ₁₆	ribbed bugle head	furring only	wide wood furring or 20 ga.	16	40	129	111	102	167	143	132
		screws		(33 mil.) steel furring ^{9,10,11,12}		60	122	106	99	158	137	127
		No. 8 X		2X4 wood or 20 ga. (33 mil) steel		0-15	127	115	105	164	149	135
Hardie [®] Panel (48"	⁵ / ₁₆	1.25" long X 0.323"	10" O.C. into furring	framing with ³ / ₄ " thick by 3.5"	16	20	127	112	102	164	145	132
and 16")	716	HD ribbed bugle head	only	wide wood furring or 20 ga.	10	40	122	104	96	157	134	124
		screws		(33 mil.) steel furring ^{9,10,11,12}		60	115	100	93	149	129	120
		No. 8 X		2X4 wood or 20 ga. (33 mil) steel		0-15	121	110	100	157	142	129
Hardie [®] Panel (48"	⁵ / ₁₆	1.25" long X 0.323"	12" O.C. into furring	framing with ³ / ₄ " thick by 3.5"	16	20	121	107	98	157	138	126
and 16")	716	HD ribbed bugle head	only	wide wood furring or 20 ga.	10	40	116	100	92	150	128	119
		screws		(33 mil.) steel furring ^{9,10,11,12}		60	110	95	89	142	123	114
		No. 8 X		2X4 wood or 20 ga. (33 mil) steel		0-15	107	97	88	138	125	114
Hardia® Danal (40")	5/	1.25" long X 0.323"	8" O.C. into	framing with 3/4" thick by 3.5"	24	20	107	94	86	138	122	111
Hardie [®] Panel (48")	⁵ / ₁₆	HD ribbed bugle head	furring only	wide wood furring or 20 ga.	24	40	103	88	81	133	113	105
		screws		(33 mil.) steel furring ^{9,10,11,12}		60	97	84	78	125	109	101
		0.090"		2X4 wood or 20		0-15	143	130	118	185	168	152
Hardio® Danal (40")	5/	shank X 0.215" HD	6" O.C. into	ga. (33 mil) steel framing with 3/4"	16	20	143	126	115	185	163	149
Hardie [®] Panel (48")	⁵ / ₁₆	x 1.5" long ring shank	furring only	thick by 3.5" wide wood	16	40	137	117	108	177	151	140
		nail		furring ^{9,10,11}		60	130	113	105	168	145	135

For **SI**: 1 ft = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s.

¹ Wind speed design assumptions per Section 6.5, Method 2, of ASCE 7-05: I = 1.0, K_{zt} = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

² Installation must be in accordance with Section 4.2 of this report.

³ Values are for species of wood having a specific gravity of 0.42 or greater.

⁴ Values are for species of wood having a specific gravity of 0.36 or greater.

 $^{^{5}}$ V_{asd} = nominal design wind speed.

⁶ V_{ult} = ultimate design wind speed.

 $^{^{7}}$ Wind speed design assumptions per Section 30.4, of ASCE 7-10: K_{zt} = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

 $^{^8}$ 2015 and 2012 IBC Section 1609.3.1, Eqn. 16-33, $\,V_{asd} = V_{ult}\,\sqrt{0.6}.$ 9 Furring attachment to structural members (framing) or alternative furring width shall be designed by the project engineer.

 ^{*}Furfing attachment to structural members (naming) or alternative furning within small be designed by the project engineer.
 10. Wood furring shall be preservative treated per AWPA.
 11. Wood furring shall be specific gravity of 0.42 or greater per AFPA/NDS, or wood structural panel, conforming to DOC PS-1 or DOC PS-2 or APA PRP-108.
 12 The design and attachment of steel furring shall be the responsibility of the project engineer.

¹³ V = basic design wind speed

 $^{^{14}}$ Wind speed design assumptions per Section 30.3, of ASCE 7-16: $K_{zt} = 1$, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

¹⁵ 2021 IBC Section 1609.3.1, Eqn. 16-17 and 2018 IBC Section 1609.3.1, Eqn. 16-33, $V_{asd} = V \sqrt{0.6}$

¹⁶ Smooth-shank stainless steel nails are outside of the scope of this report unless specifically noted.

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TABLE 4—MAXIMUM WIND SPEEDS FOR EXPOSURE CATEGORY (mph)² (Continued)

							(Basi	C, 2009 I 006 IBC/IF ic Wind S V _{asd} ^{1,5,8,11}	RC peed,)	IBC Desig V _{ult^{6,7}) IBC/IR Win}	2012 IBC and 2015 IBC/IRC(Ultimate Design Wind Speed, V _{ult} ^{6,7}), 2018 and 2021 IBC/IRC (Basic Design Wind Speed, V ^{9,10}) EXPOSURE																								
	Minimum						EXPOS	URE CAT	EGORY		ATEGOR																								
Product	Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D																							
		4d ring				0-15	111	100	91	143	129	118																							
Hardie [®] Panel (48")	⁵ / ₁₆	shank siding nails	4" O.C. along	2X4 wood ⁴	24	20	111	97	89	143	126	115																							
rialdie Faller (40)	716	(0.09" SD x 0.215 HD x	studs	2X4 W000	24	40	106	91	-	137	117	-																							
		1.5" long)				60	100	87	-	129	112	-																							
		4d ring				0-15	167	152	138	216	196	178																							
Hardie [®] Panel (16")	⁵ / ₁₆	shank siding nails	6" O.C. along	2X4 wood ⁴	24	20	167	147	135	216	190	174																							
Hardie Faller (10)	716	(0.09" SD x 0.215 HD x	studs	2X4 W000 1	24	40	160	137	127	207	177	163																							
		1.5" long)				60	152	132	122	196	170	158																							
		4d ring				0-15	151	137	125	195	177	161																							
H:® D (40")	5/	shank siding nails	8" O.C.	0)/4	0.4	20	151	133	122	195	172	157																							
Hardie [®] Panel (16")	⁵ / ₁₆	(0.09" SD x 0.215 HD x	along studs	2X4 wood ⁴	2X4 wood ⁴	2X4 wood ⁴	24	40	145	124	115	187	160	148																					
		1.5" long)				60	137	119	111	177	154	143																							
		4d ring				0-15	134	121	110	172	156	142																							
Hardie [®] Panel (16")	⁵ / ₁₆	shank siding nails	10" O.C. along	2X4 wood ⁴	2X4 wood ⁴	2X4 wood ⁴	24	20	134	118	108	172	152	139																					
Hardle ^s Panel (16)	7/16	(0.09" SD x 0.215 HD x	studs				2X4 WOOd *	24	40	128	110	101	165	141	131																				
		1.5" long)				60	121	105	98	156	136	126																							
		4d ring				0-15	113	103	93	146	132	120																							
Hordia® Donal (46")	5/	shank siding nails	12" O.C.	2X4 wood ⁴	24	20	113	100	91	146	129	117																							
Hardie® Panel (16")	⁵ / ₁₆	(0.09" SD x 0.215 HD x	along studs	2X4 W000 *	24	40	108	93	86	140	120	111																							
		1.5" long)				60	103	89	-	132	115	-																							
		4d ring		Attached to		0-15	144	131	119	186	169	154																							
Hardia® D===1/40%	5/	shank siding nails	6" O.C. along	⁷ / ₁₆ " Wood Structural	7/16" WSP Sheathing	20	144	127	116	186	164	150																							
Hardie [®] Panel (16")	⁵ / ₁₆	(0.09" SD x 0.215 HD x	panel edges ¹⁴	Panel sheathing	Panel sheathing	Panel sheathing	Panel sheathing	Panel attached sheathing per code	40	138	118	109	179	153	141																				
		1.5" long)		only		60	131	114	105	169	147	136																							
		4d ring		Structural S Panel sheathing		0-15	133	120	109	171	156	141																							
H1:-® D / / / 2"	51	shank siding nails	8" O.C. along		7/ ₁₆ " Wood Structural Panel sheathing	⁷ / ₁₆ " Wood Structural Panel sheathing	7/ ₁₆ " Wood Structural Panel	⁷ / ₁₆ " Wood Structural Panel	7/ ₁₆ " Wood Structural Panel sheathing	7/ ₁₆ " Wood Structural Panel sheathing	7/ ₁₆ " Wood Structural Panel sheathing	7/ ₁₆ " Wood Structural Panel	7/ ₁₆ " Wood	⁷ / ₁₆ " Wood	⁷ / ₁₆ " Wood	⁷ / ₁₆ " Wood	7/ ₁₆ " Wood	⁷ / ₁₆ " Wood	7/ ₁₆ " Wood	⁷ / ₁₆ " Wood	7/ ₁₆ " Wood	7/ ₁₆ " Wood	⁷ / ₁₆ " Wood	7/ ₁₆ " Wood 7/	7/ ₁₆ " WSP Sheathing	20	133	117	107	171	151	138			
Hardie [®] Panel (16")	⁵ / ₁₆	(0.09" SD x 0.215 HD x	panel edges ¹⁴										attached per code	40	127	109	101	165	141	130															
		1.5" long)		only		60	120	105	97	156	135	125																							

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							2012 IRC, 2009 IBC 2006 IBC/IRC (Basic Wind Spe V _{asd} ^{1,5,8,11}) EXPOSURE CATE			IBC Desig V _{ult^{6,7}) IBC/IR Win}	2012 IBC and 2015 IBC/IRC(Ultimate Design Wind Speec V _{ult} ^{6,7}), 2018 and 202 IBC/IRC (Basic Desi Wind Speed, V ^{9,10}) EXPOSURE								
	Minimum	T	_		<u> </u>		EXPOS	URE CAT	EGORY		ATEGOR								
Product	Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D							
		4d ring		Attached to		0-15	120	108	99	155	141	128							
Hardie [®] Panel (16")	⁵ / ₁₆	shank siding nails	10" O.C. along	7/ ₁₆ " Wood Structural	7/ ₁₆ " WSP Sheathing	20	120	106	97	155	137	125							
Tiardie Tariei (10)	716	(0.09" SD x 0.215 HD x	panel edges ¹⁴	Panel sheathing	attached per code	40	115	99	91	149	127	118							
		1.5" long)		only		60	109	95	88	141	122	113							
		4 d sin s		A44bd-4-		0-15	106	96	88	137	124	113							
	_	4d ring shank siding nails	12" O.C. along	Attached to ⁷ / ₁₆ " Wood Structural	7/16" WSP Sheathing	20	106	94	86	137	121	110							
Hardie [®] Panel (16")	⁵ / ₁₆	(0.09" SD x 0.215 HD x	panel edges ¹⁴	Panel sheathing	attached per code	40	102	87	-	132	113	-							
		1.5" long)		only		60	96	-	-	124	-	-							
						0-15	181	164	149	234	212	192							
Hardie [®] Architectural	_	6d common,				20	181	159	146	234	205	188							
Panels (non-grooved)	⁵ / ₁₆	2in. long	4	2x4 wood ³ 16	40	174	148	137	225	191	177								
						60	164	142	132	212	183	170							
						0-15	144	130	118	186	168	152							
Hardie [®] Architectural	5/	6d common,	0	04 13	40	20	144	127	116	186	164	150							
Panels (non-grooved)	⁵ / ₁₆	2in. long	6	2x4 wood ³	2x4 wood ³	∠x4 wood³	2x4 wood ³	2x4 wood ^s	2x4 woods	2X4 WOOd ⁵	2x4 wood ³	16	40	138	118	109	178	152	141
						60	130	113	105	168	146	136							
						0-15	141	128	116	182	165	150							
Hardie® Architectural	⁵ / ₁₆	6d common,	4	2x4 wood ³	24	20	141	124	113	182	160	146							
Panels (non-grooved)	/16	2in. long	4	2X4 W000	24	40	135	116	107	174	150	138							
						60	128	111	103	165	143	133							
						0-15	114	103	94	147	133	121							
Hardie [®] Architectural	⁵ / ₁₆	6d common,	6	2x4 wood ³	24	20	114	101	92	147	130	119							
Panels (non-grooved)	, 16	2in. long		2.7. 11000		40	109	94	86	141	121	111							
						60	103	90	-	133	116	-							
		4d, 0.091 in				20	112	98	90	144	127	116							
Hardie [®] Architectural Panels (non-grooved)	⁵ / ₁₆	shank x 0.225in. HD x 1.5 in.	4 edge 8 field	2x4 wood ³	16	40	107	92	85	138	119	110							
		long ring shank nail				60	101	88	-	130	114	-							

							20 (Basi	C, 2009 I 06 IBC/II c Wind S / _{asd} ^{1,5,8,11}	RC Speed,	IBC Desig V _{ult} ^{6,7}) IBC/IR	PIBC and IRC(Ult gn Wind g, 2018 and C (Basid d Speed	imate Speed, nd 2021 : Design
								XPOSUF ATEGOF			XPOSU ATEGO	
Product	Minimum Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D
						0-15	119	108	98	153	139	126
Hardie [®] Architectural		16-ga. x 1.5" long	4" O.C.			20	119	105	95	153	135	123
Panels (non-grooved)	⁵ / ₁₆	stainless steel finish	along studs	2X4 wood ³	16	40	114	97	90	147	126	116
		nails				60	108	93	87	139	120	112
						0-15	124	113	102	160	145	132
Hardie [®] Architectural		16-ga. x 1.5" long	4" O.C.			20	124	109	100	160	141	129
Panels (non-grooved)	⁵ / ₁₆	stainless steel finish	along studs	2X4 wood ⁴	16	40	119	102	94	154	131	121
		nails				60	113	98	91	145	126	117
			4" 0 0	2X4 wood ⁴		0-15	133	121	110	172	156	142
Hardie® Architectural	6.	16-ga. x 1.5" long	4" O.C. along studs and	with ⁷ / ₁₆ " Wood Structural		20	133	117	107	172	152	138
Panels (non-grooved)	⁵ / ₁₆	stainless steel finish	vertical panel	Panel sheathing	16	40	128	109	101	165	141	130
		nails	edges ¹³	attached per code		60	121	105	97	156	135	126
			4" O.C.	2X4 wood ⁴ with ⁷ / ₁₆ "		0-15	114	103	94	147	133	121
Hardie® Architectural	⁵ / ₁₆	16-ga. x 1.5" long	along studs and	Wood Structural	04	20	114	100	92	147	130	118
Panels (non-grooved)	7/16	stainless steel finish nails	vertical panel	Panel sheathing	24	40	109	93	86	141	121	111
		Hullo	edges ¹³	attached per code		60	103	90	-	133	116	-
			4" 0 0	2X4 wood ³ with ⁷ / ₁₆ "		0-15	108	98	89	139	126	115
Hardie® Architectural		16-ga. x 1.5" long	4" O.C. along studs and	With 1/16 Wood Structural		20	108	95	87	139	123	112
Panels (non-grooved)	⁵ / ₁₆	stainless steel finish	vertical panel	Panel sheathing	24	40	104	89	-	134	114	-
		nails	edges ¹³	attached per code		60	98	-	-	126	-	-
		16-ga. x				0-15	110	100	91	142	129	117
Hardie® Architectural	⁵ / ₁₆	1.5" long stainless	4" O.C. along	2X4 wood ⁴	24	20	110	97	88	142	125	114
Panels (non-grooved)		steel finish nails	studs			40 60	105 100	90 86	-	136 129	116 112	-
						0-15	111	100	91	143	129	118
		4d ring shank	= -					97	89	143		
Hardie® Architectural Panels (non-grooved)	⁵ / ₁₆	siding nails (0.09" SD x	4" O.C. along	2X4 wood ⁴	24	20	111				126	115
		0.215 HD x 1.5" long)	studs			40	106	91	-	137	117	-
						60	100	87	-	129	112	-
		No. 8, 1- ⁵ / ₈ in. long x		Attached to ⁷ / ₁₆ " Wood	⁷ / ₁₆ " WSP	0-15 20	150 150	136 132	123 120	194 194	176 170	159 155
Hardie [®] Architectural Panels (non-grooved)	⁵ / ₁₆	0.375" HD Ribbed	6" vert. 12" horiz.	Structural Panel	Sheathing attached	40	143	123	113	185	159	146
		wafer head screw		sheathing only	per code	60	136	118	109	176	152	141

				SPEEDS FOR E		·	20 ⁻ IB (Basi	12 IRC, 20 C/IRC, 20 IBC/IRC c Wind S V _{asd} ^{1,5,8,11}	009 006 peed,	IBC/ Design V _{ult} ^{6,7}), IBC/IRC	IBC and IRC(Ultin n Wind S 2018 and C (Basic I I Speed, V	nate peed, I 2021 Design																			
								XPOSUR ATEGOR		EXPOSI	JRE CAT	EGORY																			
Product	Minimum Product Thickness (in.)	Fastener Type ¹²	Fastener Spacing (in.)	Frame Type	Stud Spacing (in.)	Building Height (ft.)	В	С	D	В	С	D																			
		4d ring				0-15	118	107	97	153	138	126																			
Hardie [®] Architectural		shank siding nails	6" O.C. vertical,	Attached to ⁷ / ₁₆ " Wood Structural	⁷ / ₁₆ " WSP Sheathing	20	118	104	95	153	135	123																			
Panels (non-grooved)	⁵ / ₁₆	(0.09" SD x 0.215" HD x	16" O.C. Horizontal	Panel sheathing only	attached per code	40	113	97	90	146	125	116																			
, ,		1.5" long)		,		60	107	93	86	138	120	112																			
		Metabo 16-				0-15	89	-	-	115	-	-																			
Hardie [®] Architectural		ga.(0.063" SD) x 1.5"	4" O.C.			20	89	-	-	115	-	-																			
Panels (grooved)	⁵ / ₁₆	long stainless	along studs	2X4 wood ⁴	24	35	87	-	-	112	-	-																			
(groovou)		steel finish nails				40	-	-	-	-	-	-																			
						0-15	118	107	97	153	138	126																			
Hardie®		4d ring shank	6" O.C.	Attached to ⁷ / ₁₆ " Wood Structural Panel sheathing only	Wood Structural Panel sheathing	Wood Structural Panel sheathing	Wood Structural Panel sheathing	Wood Structural Panel sheathing		⁷ / ₁₆ " WSP	20	118	104	95	153	135	123														
Architectural Panels (grooved)	5/16	siding nails (0.09" SD x 0.215" HD x	vertical, 16" O.C. Horizontal						Sheathing attached per code	40	113	97	90	146	125	116															
(grooved)		1.5" long)	Tionzoniai		code	60	107	93	86	138	120	112																			
			6" O.C.			0-15	148	134	122	191	173	158																			
Hardie [®]		6d siding nails	along studs, 16"			20	148	131	119	191	169	154																			
Architectural Panels	⁵ / ₁₆	(0.092" SD x 0.222" HD x	O.C. along top and	2X4 wood ³	16	40	142	121	112	183	157	145																			
(grooved)		2" long)	bottom plates			60	134	117	108	173	150	140																			
						0-15	135	122	111	174	158	144																			
Hardie [®]		No. 8 X 1.25"long x		Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in.			20	135	119	109	174	154	140																		
Architectural Panels	⁵ / ₁₆	0.323" HD ribbed bugle	8" O.C.	x 1 ³ / ₈ in. metal C-stud or 2 X 4	16	40	129	111	102	167	143	132																			
(grooved)		head screws		wood studs ³		60	122	106	99	158	137	127																			
						0-15	127	115	105	164	149	135																			
Hardie [®]		No. 8 X 1.25" long X		Min. No. 20 ga. (33 mil) X 3 ⁵ / ₈ in.		20	127	112	102	164	145	132																			
Architectural Panels	⁵ / ₁₆	0.323" HD ribbed bugle	10" O.C.	x 1 ³ / ₈ in. metal C-stud or 2 X 4	16	40	122	104	96	157	134	124																			
(grooved)		head screws		wood studs ³		60	115	100	93	149	129	120																			
						0-15	121	110	100	157	142	129																			
Hardie [®]		No. 8 X 1.25" long X		Min. No. 20 ga.		20	121	107	98	157	138	126																			
Architectural Panels	⁵ / ₁₆	0.323" HD ribbed bugle	12" O.C.	(33 mil) X 3 ⁵ / ₈ in. x 1 ³ / ₈ in. metal C-stud or 2 X 4 wood studs ³ 2X4 wood or 20 ga. (33 mil) steel framing with 3 ¹ / ₈	16	40	116	100	92	150	128	119																			
(grooved)		head screws				60	110	95	89	142	123	114																			
						0-15	143	130	118	185	168	152																			
Hardie [®]		0.090" shank X	6" O.C.		ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5"	ga. (33 mil) steel													20	143	126	115	185	163	149
Architectural Panels	⁵ / ₁₆	0.215" HD x 1.5" long	into furring only									16	40	137	117	108	177	151	149												
(grooved)		ring shank nail	Oilly			60	130	113	105	168	145																				
						υσ	130	113	105	וטס	145	135																			

							2012 IRC, 2009 IBC/IRC, 2006 IBC/IRC (Basic Wind Speed, Vasd ^{1,5,8,11})			2012 IBC and 2015 IBC/IRC(Ultimate Design Wind Speed, Vult ^{6,7}), 2018 and 2021 IBC/IRC (Basic Design Wind Speed, V ^{9,10}) EXPOSURE		
							CATEGORY			CATEGORY		
Hardie [®] Architectural Panels (grooved)	⁵ / ₁₆	No. 8 X 1.25"long X 0.323" HD ribbed bugle head screws	8" O.C. into furring only	2X4 wood or 20 ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5" wide wood furring or 20 ga. (33 mil.) steel furring ^{9,10,11,12}	16	0-15	135	122	111	174	158	144
						20	135	119	109	174	154	140
						40	129	111	102	167	143	132
						60	122	106	99	158	137	127
Hardie [®] Architectural Panels (grooved)	⁵ / ₁₆	No. 8 X 1.25"long X 0.323" HD ribbed bugle head screws	10" O.C. into furring only	2X4 wood or 20 ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5" wide wood furring or 20 ga. (33 mil.) steel furring ^{9,10,11,12}	16	0-15	127	115	105	164	149	135
						20	127	112	102	164	145	132
						40	122	104	96	157	134	124
						60	115	100	93	149	129	120
Hardie [®] Architectural Panels (grooved)	⁵ /16	No. 8 X 1.25" long X 0.323" HD ribbed bugle head screws	12" O.C. into furring only	2X4 wood or 20 ga. (33 mil) steel framing with ³ / ₄ " thick by 3.5" wide wood furring or 20 ga. (33 mil.) steel furring ^{9,10,11,12}	16	0-15	121	110	100	157	142	129
						20	121	107	98	157	138	126
						40	116	100	92	150	128	119
						60	110	95	89	142	123	114

For SI: 1 ft = 305 mm, 1 inch = 25.4 mm, 1 mph = 0.44 m/s.

¹ Wind speed design assumptions per Section 6.5, Method 2, of ASCE 7-05: I = 1.0, K_{zt} = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

² Installation must be in accordance with Section 4.2 of this report.

³ Values are for species of wood having a specific gravity of 0.42 or greater.

⁴ Values are for species of wood having a specific gravity of 0.50 or greater.

 $^{^{5}}$ V_{asd} = nominal design wind speed.

⁶ V_{ult} = ultimate design wind speed.

 $^{^{7}}$ Wind speed design assumptions per Section 30.4, of ASCE 7-10: K_{zt} = 1, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

 $^{^{8}}$ 2015 and 2012 IBC Section 1609.3.1, Eqn. 16-33, $~V_{asd}=V_{ult}\,\sqrt{0.6}.$

⁹ V = basic design wind speed

 $^{^{10}}$ Wind speed design assumptions per Section 30.3, of ASCE 7-16: $K_{zt} = 1$, Kd = 0.85, GCpi = 0.18, GCp = -1.4.

¹¹ 2021 IBC Section 1609.3.1, Eqn. 16-17 and 2018 IBC Section 1609.3.1, Eqn. 16-33, $V_{asd} = V \sqrt{0.6}$

¹² Smooth-shank stainless steel nails are outside of the scope of this report unless specifically noted.

¹³ Vertical edges of each panel permitted to be fastened to WSP sheathing only (remainder of panel must be fastened to the studs through the sheathing).

¹⁴ Long edges of each panel permitted to be fastened to WSP sheathing only (short edges are not required to be fastened).



ICC-ES Evaluation Report

ESR-1844 CBC and CRC Supplement

Reissued November 2023 Revised May 2024 This report is subject to renewal November 2025.

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 16 00—Sheathing

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

JAMES HARDIE BUILDING PRODUCTS, INC.

EVALUATION SUBJECT:

HARDIE® PANEL (PREVAIL®, CEMPANEL®) SIDING, HARDIE® ARCHITECTURAL PANELS HARDIFLEX® SIDING AND HARDITEX BASEBOARD

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Hardie[®] Panel (Prevail[®], Cempanel[®]) siding, Hardie[®] Architectural Panels, HardiFlex[®] siding and Harditex[®] baseboard, described in ICC-ES evaluation report ESR-1844, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

■ 2022 California Building Code® (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

■ 2022 California Residential Code® (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Hardie® Panel (Prevail®, Cempanel®) siding, Hardie® Architectural Panels, HardiFlex® siding and Harditex® baseboard, described in Sections 2.0 through 7.0 of the evaluation report ESR-1844, comply with CBC Chapter 14, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 14 and 17, as applicable.

- 2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.
- 2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

2.2 CRC

The Hardie® Panel (Prevail®, Cempanel®) siding, Hardie® Architectural Panels, HardiFlex® siding and Harditex® baseboard, described in Sections 2.0 through 7.0 of the evaluation report ESR-1844, comply with CRC Chapter 7, provided the design and installation are in accordance with the 2021 *International Residential Code®* (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued November 2023 and revised May 2024.

